medal, or partly one and partly the other, for the reward of original discovery in the physical sciences, particularly electricity and magnetism, or their applications." A gold medal, to be called the "Hughes" medal, will be awarded for the first time this year.

These bequests involve corresponding obligations, as may be seen under the heading of "The Trusts of the Royal Society," and the multiplicity and variety of these and similar responsibilities, duly recorded in the volume under review, appear to have stimulated the Council to something in the nature of a protest and an appeal; for, by a memorandum facing the first page of the "Record," we learn that the Council has arrived at the conclusion that it is neither to the advantage of the Society nor in the interests of the advancement of natural knowledge that the already long list of medals should be added to, and the Council expresses the opinion that no further bequests for awards as prizes for past achievements should be accepted by the Society. The memorandum then proceeds to direct attention to the fact that the funds belonging absolutely to the Society and available without restrictions for its general purposes are very few indeed, and that the usefulness of the Society has been greatly hampered by the lack of such funds.

These facts are familiar to those acquainted with the working of the Society, but outside this circle there seems to exist a general impression, whether it be due to the Royal Society's ancient and honourable association with the throne, or to its occupying handsome premises in Burlington House, or to its entertainments in the London season, that it is a wealthy body, able to dispense material assistance to all and sundry undertakings in the wide field of natural knowledge. How far this is from the truth may be seen from the statement of the Society's income published in the "Year-Book." In this we see that the total regular income of the Society, apart from funds which it administers in a fiduciary character, amounts only to about 5000*l*., and out of this, supplemented by various small miscellaneous, and vicarious, receipts and a portion of the Government publication grant, provision has to be found for an expenditure which last year amounted to 2572*l*. on its publications alone, and 1300*l*. for its "Catalogue of Scientific Papers," in addition to all the expenses of establishment and library. Such a condition of affairs, hampering, as we are told it does, the usefulness of the Society, which has been aptly described by a distinguished foreign savant as "the mother of learned societies," and renders almost daily to the nation important services in matters of deep concern to the people in all parts of the Empire, is testimony only too eloquent to the indifference with which the pursuit of science is regarded in this country.

Space forbids us to refer at length to other undertakings in which advance is recorded in this volume. One of the most important is the completion of the "Supplementary Volume of the Catalogue of Scientific Papers," a volume of 807 quarto pages containing a list of the papers not previously catalogued in the volumes already published, for the period ending with 1883. The Society has already embarked upon the compilation of a similar catalogue for the period 1883-1900. With the completion of this work, however, the Royal Society's direct responsibilities in this matter will cease, the task being taken up from that point by the organisation, to which attention has more than once been called in these columns, of the "International Catalogue of Scientific Literature."

Other matters of more strictly domestic interest are duly recorded. The Society's collection of portraits and medals has received some notable additions. The lists of presidents and other officers, and of the recipients of the Society's medals, are brought up to date.

But perhaps the most interesting part of the volume is the list of Fellows of the Society from its foundation up to the present time. Such a roll of worthies furnishes a wealth of suggestion to the student of natural knowledge, and their biographies, if they could be presented to us in due sequence, would form an epitome of the history of scientific advance during the past 240 years which might almost be said to be synonymous with the history of the development of modern England. A word must be added in praise of the interesting series of portraits which is begun in the "Record," reproduced from photographs made by Sir William Abney from pictures in the possession of the Society. The present volume contains portraits of Sir Isaac Newton, Henry Oldenburg, Lord John Somers and Sir James Burrow, and we are promised a continuation of the series in future editions of the work.

The principal new feature in this year's "Year-Book," now in its sixth issue, is the incorporation of the complete official list of Fellows of the Society living on January 1, 1902, in place of the abbreviated list which has hitherto done duty in this work. This expanded list has added twenty pages to the size of the handbook, which contains besides, among other current information, the statutes and standing orders of the Society, lists of its Council and its twenty-six standing committees, the regulations for the administration of the Government grant for scientific investigations, the president's anniversary address and the annual report of the Council, with a statement of accounts and obituary notices of Fellows deceased. Appended to the Council's report is the report of a committee of the Society upon the vexed question of the organisation of philosophico-historical studies, a subject which has been already much discussed in the Press. Altogether the "Year-Book" indicates clearly enough how multifarious and important are the activities of the Royal Society.

THE FUTURE OF THE VICTORIA UNIVERSITY.

DURING the next few months the Privy Council will be called upon to come to a decision on a matter vitally affecting higher education in the north of England. The Victoria University, which has been in existence for twenty-three years, has come to a stage in its career when its future must be definitely settled. Liverpool has applied for a separate charter, and Owens College gives its hearty support to the establishment of three distinct and independent universities in place of the present federation.

The ambition of Manchester to have an independent university is not of recent growth. In the year 1641 a petition was presented to Parliament asking for a charter, but rival claims were brought forward by the town of York and nothing came of the effort. A fresh start in the same direction was made in 1836, but only resulted in the affiliation of the Manchester Academy to the London University. The more recent attempts of Owens College to establish a university in the city of Manchester will be in the recollection of many readers of NATURE. The opposition of Yorkshire (history repeats itself) was again successful, and led to the foundation of the Victoria University, which has, on the whole, worked well. What, then, are the reasons for its proposed dissolution?

The functions of a university are threefold—to teach, to advance knowledge and to examine. The more intimately these three functions are interwoven, the more effectively will the university fulfil its purpose. Their separation has been the great impediment to the progress of university education in this country. This is beginning to be recognised, and the recent efforts of Wales, of Birmingham and of London all tend in the direction of subordinating examination to teaching and of giving a proper place in the university ideal to research and advance of knowledge.

The Victoria University was founded in order to establish a greater harmony between teaching and examining than was possible under the old system, which gave the London University control of the examinations. This worked well for a time, but owing to the growth in the number of students, owing also to the different directions in which the three colleges are developing, we are rapidly drifting back to the old state. Victoria University is now practically an examining body, which unites all disadvantages, for while on the one hand it controls the teaching too much in some directions, it is unable to secure uniformity of standard in others. This is a fundamental defect of the federal system, which can only work well during the early growth of the federated colleges, and will always break down as soon as some of the colleges are strong enough to stand alone.

As a mere piece of administrative machinery, the federal university must always be clumsy and wasteful. Its statutes and regulations must be framed to satisfy the various and sometimes diverging requirements of the different colleges. This can only be done by means of endless meetings and constant compromises. It is the duty of every teacher to give up a portion of his time to administrative work, and he will be glad to do so if satisfactory results may be arrived at without a wasteful expenditure. Every man has only a certain amount of strength and energy, and every hour spent in the committee room is so much taken away from his power of promoting knowledge. Simplicity of machinery is a matter of primary importance in university organisation, and it is not too much to assert that whatever success the Victoria University has achieved, it has done at the expense of taking away a very substantial and unnecessary amount of time, which its teachers might more profitably have spent in their studies or laboratories.

The objections to the splitting of the Victoria University are chiefly based on the assumption that a multiplication of universities is bad in itself. "Union is strength" is a good party cry, but the saying is not true when the union is of the kind one gets in a three-legged race. If there are universities in Manchester, Liverpool and Leeds, it is further asked, why not one in Sheffield or in Oldham, Rochdale or Burnley? Such objections are not serious, and savour too much of the political platform. We might as well argue that we should not eat and drink enough because we might possibly eat and drink too much. Surely, if a town possesses a college of sufficient standing to supply the highest teaching in its various faculties, it it is established on such financial basis as will secure its permanence and its capability of attracting teachers of eminence in the future, and if there is a sufficient supply of students, no reason can be urged against the creation of a fresh university.

Competition and rivalry, it is argued, will lower the standard of a degree. This objection springs from that distrust of the teaching profession which has been one of the chief causes of the backward state of education in this country, and is only now being slowly overcome. Because it is believed that a teacher, if left to himself, will neglect his duties, all kinds of safeguards, external examinations and inspections are invented, which may be excellent if intended to help the teacher, but are bound to break down if used to overlook and correct him. The three Dutch universities of Amsterdam, Leyden and Utrecht are nearer to each other than Liverpool, Leeds and Manchester. Though subject to certain State regulations as regards curricula, the teachers are entirely free to fix their own standard of examination. Any of these universities could, if it wished, lower its standards and give its degrees on easier terms than the other two. If they do not do so, it is because they are not foolish enough to commit suicide, but desire to attract the best students, and keep them for post-graduate and research work. Rivalry will be found to act as a healthy stimulant and not as a temptation.

America is sometimes pointedly referred to as an example of the evil effects of the multiplication of universities, and of the danger which accompanies the complete freedom of power to confer degrees. This freedom has apparently led to the depreciation of degrees in the case of a few institutions which abuse their privilege. But the standard of university education in a country should be judged by its highest and not by its lowest work, and when we think of university education in America we think of Harvard, of Yale, of Cornell and other places of high reputation, and do not trouble about a few insignificant places, which after all do very little harm.

If we could secure another half-dozen efficient and progressive universities in England, they would not be too dearly purchased, even if by some mischance one or two were established which did not justify their existence. But there is no fear as regards the immediate question at issue that any lowering of standard will result from the separation of the three northern colleges. In this country it is the old and not the new universities which are tempted to give degrees on insufficient attainments, and can do so without loss of prestige.

There are, of course, matters in which cooperation is desirable. Different entrance or preliminary examinations would obviously be objectionable and complicate the work of the schoolmaster who prepares boys for the university. Unification is here called for, not only as between the three colleges of the Victoria University, but throughout the country. The question of separation should not be mixed up with the no doubt very important question of admission to a university course.

A plausible argument against the multiplication of degree-giving bodies is found in the case of medicine, where the degree carries a qualification with it. The fact that this objection has been very strongly urged shows that our present system is not understood, and that separation is called for in the interest of a clearer definition of the meaning of our degrees. Efficiency is most easily secured if the burden of responsibility is placed on the right shoulders. Let each college give its own stamp to its own graduates, and the college will take better care to secure good teaching than while it can shelter itself behind the nondescript "Victoria University." This holds with special force where the examination, as in medical subjects, is to a great extent of a practical character. It is impossible in these cases to secure equality, and if the public is induced to think that the training or even the examination test is necessarily identical the public is deceived. If separation means the clearer realisation of the nature of the training received, separation is an advantage.

It will be to the ultimate good of each institution, if it feels the weight of its responsibility, and is more immediately made to suffer in public estimation for deficiencies in any of its departments. The effect of this feeling of responsibility is very real and swift. Liverpool has already raised a large sum of money conditionally on a charter being granted, and Leeds has put down its wants at a high figure. What is all this money wanted for except to make the teaching more efficient? It is wanted just as much whether the Victoria University remains as it is or divides; but the probable establishment of separate universities has roused the feeling of responsibility, and brought the gaps and deficiencies home to the governing bodies and to the public.

One further and very cogent argument must be brought forward. University education is often looked upon too much as a matter standing by itself, and without relationship to the previous training of the boys at school, or the parallel training in technical colleges. If a coordination of education is desirable, a federal university of colleges situated in three large cities becomes an impossibility. It is not necessary to argue this point in detail. Those who know the conditions of educational facilities in the north of England, will realise that the great diversity which exists in the three towns is bound to render one common organisation so cumbersome that it would necessarily check the freedom of development which is essential to success. Speaking for Manchester alone, does it need further argument that a more effective university may be formed by a close cooperation between Owens College, the Municipal School of Technology, the School of Art, the College of Music, and the various theological colleges, than is possible with the present federation, which is confined to Owens College alone? And is it not obvious that the interest in higher education which would be roused by the common feeling of the governing bodies of all these institutions for a great university in Manchester will more effectively secure a high standard of work and a progressive spirit, than the artificial union of three colleges in different towns? In our effort to secure educational freedom we count on the sympathy of all who are truly anxious for educational progress, and we count more especially on the help of those who are now working out a similar problem in the University of London.

ARTHUR SCHUSTER.

NOTES.

WE regret to see the announcement of the death of M. H. Faye, the eminent French astronomer, at the age of eighty-eight years.

DR. J. G. GARSON has been appointed assistant general secretary of the British Association, in succession to the late Mr. G. Griffith.

SPECIMENS of volcanic dust collected in St. Vincent and Martinique, during the recent eruptions, which have been placed by the Colonial Office at the disposal of the Board of Education, are exhibited in the Western Galleries of the Victoria and Albert Museum. To this exhibit there has been added some dust which fell in Barbados, with chemical analyses of the same, and drawings of the minerals which it contains.

THE United States Congress has amended the law which provided for the opening of the Universal Exposition at St. Louis, May 1, 1903, by deferring it for one year. This has been done for many reasons, the principal being that, since its inception, the scope of the exhibition has enlarged. Up to the middle of June the money available for the exhibition, including State and national appropriations, amounted to more than 4,000,000*l*.

A CORRESPONDENT sends us a cutting from the *Manchester Guardian*, announcing that Mr. Assheton Smith has consented to present to the University College of North Wales a site on the Menai Straits for the erection of a marine zoological station. A special fund for the erection of this station is being started, and already Mr. H. R. Davies, of Treborth, who has acted as treasurer of the Puffin Island station since 1892, has led off with a handsome subscription.

WITH respect to the recent coloured sunsets that have been and are being seen in this country, it is interesting to note that similar phenomena are being observed in Germany. Thus the Berlin correspondent of the *Standard* writes (July 7):—"For some time past, both at sunrise and towards dusk, there has been visible here a remarkable glow of colour on the horizon, the sky exhibiting an appearance of unusual beauty. Men of science put forth the theory that this phenomenon is caused by particles in the air emanating from the fiery mass ejected by Mont Pelée." The coloured sunsets referred to last week (pp. 222, 230) were noticed at Lewisham on the evening of June 26. Mr. R. McLachlan, F.R.S., writes to say that when facing nearly due east his attention was attracted by a peculiar tint in the sky. On proceeding to the front of the house the effect was extremely brilliant, the red predominating. Mr. McLachlan thinks the tint in the eastern sky was probably due to reflection. Mr. A. R. Tankard writes to confirm the observations of remarkable sunsets at Madeira, described by Mr. F. W. T. Krohn in NATURE of June 26. He says that the peculiar sunset effects were not visible in the district of the Canary Isles and Madeira during April. As the chief eruptions in Martinique and St. Vincent took place in the first two weeks of May, and the curious effects described made their appearance subsequently, namely, in the early days of June, their connection with the eruptions is rendered probable.

A NOTE in a recent number of the *British Journal of Photography* (July 4) gives a brief account of a balloon voyage of a very uncomfortable nature that was made by Dr. Miethe in company with Lieutenant Hildebrandt. The account, which is taken from the *Photographisches Wochenblatt*, states that the ascent was made at Tegel in the afternoon at three o'clock, and the balloon came to earth at half-past six between Nieder-Finow and Liepe. At the ascent the balloon passed first through a mist, and then suddenly into a thunder cloud. After attaining a height of 200 metres, the balloon was suddenly carried to an altitude of 2000 metres, and then as suddenly fell half that distance. Meanwhile the storm was proceeding, but although the travellers did not see the lightning they were deafened with the thunder, and pelted with rain, hail and sleet. In their rapid leaps and plunges the car was frequently on a level with the balloon, and the tow-rope above their heads. The violent rocking of the car also added to the danger. Watches were not thought of, but according to the barograph this frightful experience must have lasted half-an-hour, when, through loss of gas by pressure, the balloon fell from a height of 2200 metres upon a dense wood of beeches, but for which the travellers would probably have lost their lives. One of them descended by the rope, and obtained help from the villagers at Liepe.

WE have to record the death by drowning, on Tuesday, July 1, of Mr. A. D. Hogg, a student of the Royal College of Science, London. Mr. Hogg, who had been a botanical assistant to Prof. Bayley Balfour in the University of Edinburgh, his native place, came to London and the Royal College of Science as a National Scholar in the autumn of 1901. Having obtained high qualification in botany, zoology and geology, he recently proceeded to St. Andrew's, at the suggestion of Prof. Howes, to study under Prof. McIntosh, in preparation for his return to South Kensington and zoology in the coming autumn. On the evening of his first day in the Gatty Marine Laboratory, seeking quietude and respite from the western sands, which were crowded at the time, he wandered to the mouth of the river to bathe. Not knowing the dangers of the spot, he swam out and was overcome, and in his loss science has become the poorer by an earnest and promising student.

REPORTS from Vienna, published in the *Daily Mail*, state that a severe earthquake lasting twenty seconds occurred at Salonica at 4.20 p.m. on Saturday, July 5. Before the news reached Vienna the instruments at the Laibach Seismological Observatory registered a great disturbance towards the south-east at an estimated distance of 600 miles. Later telegrams state that the earthquake was felt right across the Balkan peninsula. The shocks began on Saturday afternoon, and continued with frequent intervals until midday on Monday. A very cold wind is said to have accompanied the earthquake. More than 200 houses were wrecked at the village of Bani, three miles from Salonica.

IT is reported that two slight shocks of earthquake occurred in the neighbourhood of Cheadle, Cheshire, on July 8.